

Control Systems

Boeing Commercial Airplane Company, Seattle, Washington is the world's largest producer of airline transport aircraft, such as the new standard body 757 (flight deck pictured) and wide body 767 jetliners. For advancement of the technology incorporated in Boeing airplanes, the company conducts a broad and continuing program of research and development. One facet of this effort involves research on control systems, devices whose electronic signals guide or control specific aircraft functions, for example, flight management computers that provide accurate engine thrust settings and flight path guidance throughout a flight, or electronic engine controls for precise engine operation.

Boeing's Flight Control Department has developed an advanced control synthesis package for both continuous and discrete (discontinuous) control systems. As a starting point for development of discrete control systems, department engineers relied on a software package known as ORACLS; developed by Langley Research Center, it was used by Boeing for computerized analysis of new system designs. Resulting applications include a multiple input/output control system for the terrain-following navigation equipment of

the Air Force's B-1 bomber, and another for controlling in-flight changes in wing camber—the fore-aft curve of the airfoil—on an experimental airplane.

The Flight Control Department reported that use of ORACLS saved at least two years of programming time in development of the advanced control synthesis package. ORACLS is one of 1,300 computer programs developed by NASA and other agencies that are available for use by industrial and other organizations. The programs are supplied by NASA's Computer Software Management and Information Center (COSMIC)[®], located at the University of Georgia.

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